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(54) Title: PREPARATION AND FOOD PRODUCT COMPRISING AN ACTIVE PHYTASE

(57) **Abstract:** The invention relates to a preparation comprising an active phytase, a phytate and an essential cation, said preparation being characterized in that at least part of the essential cation is bound to phytate. The preparation may comprise between 1 and 100 FTU phytase per gram phytate, between 1 and 50 g essential cation bound to phytate and between 50 and 99 g of phytate per 100g of essential cation bound to phytate. The essential cations are selected from the group consisting of calcium, zinc, iron, magnesium, cobalt, molybdenum, manganese, chromium, copper or a combination thereof. The preparation may comprise an additional component such as a chelating agent and/or an antioxidant. The invention also relates to a method for making the preparation of the invention and to its use for making a fortified food product. The invention also relates to a condiment, a cereal product or a soymilk comprising an active phytase.

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A. CLASSIFICATION OF SUBJECT MATTER					
IPC 7 A23L1/304 A23L1/03 A23L1/105 A23L1/164 A23C19/068 A23L1/325 A23L1/221 A23L1/24 A23L1/10 A23L2/39 A23C9/16 A23L1/223 A23L1/238 A23C11/10 A23C9/12					
According to International Patent Classification (IPC) or to both national classification and IPC					
B. FIELDS SEARCHED					
Minimum documentation searched (classification system followed by classification symbols)					
IPC 7 A23L A23K A61K C12N A23C					
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched					
Electronic data base consulted during the International search (name of data base and, where practical, search terms used)					
EPO-Internal, WPI Data, PAJ, BIOSIS, MEDLINE, FSTA					
C. DOCUMENTS CONSIDERED TO BE RELEVANT					
Category	Citation of document, with indication, where appropriate, of the relevant passages				Relevant to claim No.
X	DE 101 26 970 A (KRUEGER GMBH & CO KG) 5 December 2002 (2002-12-05) column 1, line 3 - column 2, line 64 column 3, line 35 - column 4, line 19 example 1 claims 1-21				1-10
X	WO 02/054881 A (DSM NV ; BEUDEKER ROBERT FRANCISCUS (NL)) 18 July 2002 (2002-07-18) cited in the application				1-10
Y	page 1, line 10 - page 4, line 13				1-5,7-10
Y	claims 1-10				1-8,10
Y	US 2 834 678 A (HANSON WILLIAM A) 13 May 1958 (1958-05-13) the whole document				1-8,10
					-/-
<input checked="" type="checkbox"/> Further documents are listed in the continuation of box C.			<input checked="" type="checkbox"/> Patent family members are listed in annex.		
° Special categories of cited documents :					
"A" document defining the general state of the art which is not considered to be of particular relevance			"T" later document published after the International filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention		
"E" earlier document but published on or after the international filing date			"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone		
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"P" document published prior to the international filing date but later than the priority date claimed					
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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2 310 383 A (EVANS LACEY H ET AL) 9 February 1943 (1943-02-09) the whole document	1-5,7-10
X	RIMBACH G ET AL: "ENHANCEMENT OF ZINC UTILIZATION FROM PHYTATE-RICH SOY PROTEIN ISOLATE BY MICROBIAL PHYTASE" DIALOG FSTA, 1993, XP002029490 abstract	1-8
X	EP 0 619 369 A (AVEVE NV) 12 October 1994 (1994-10-12) page 2, line 26 - page 34, line 9 page 4, line 44 - line 58 example xiv	1-8,10
X	US 5 217 959 A (SABIN ROBERT) 8 June 1993 (1993-06-08) column 4, line 30 - column 5, line 50 claims 1-10	1-7,10
X	DATABASE WPI Section Ch, Week 199519 Derwent Publications Ltd., London, GB; Class B04, AN 1995-143836 XP002171298 & JP 07 067635 A (AMANO PHARM KK) 14 March 1995 (1995-03-14) abstract	1-6,8-10
X	ANNO T ET AL: "ENZYMATIC ELIMINATION OF PHYTATE IN SOYBEAN MILK" DIALOG FSTA, 1985, XP002029489 abstract	1-3,5-10
X	DATABASE WPI Section Ch, Week 198444 Derwent Publications Ltd., London, GB; Class D13, AN 1984-272178 XP002167383 & JP 59 166049 A (NIPPON SHINYAKU CO LTD) 19 September 1984 (1984-09-19) the whole document	1-10
A	LONNERDAL B: "Phytic acid-trace element (Zn, Cu, Mn) interactions." INTERNATIONAL JOURNAL OF FOOD SCIENCE & TECHNOLOGY 37 (7) 749-758 2002 DEP. OF NUTR., UNIV. OF CALIFORNIA, DAVIS, CA 95616, USA. FAX +1 530 752 8966. E-MAIL BLONNERDAL(A)UCDAVIS.EDU, 2002, XP002287639 the whole document	1-10
		-/-

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	TURK M ET AL: "PHYTATE DEGRADATION DURING BREADMAKING EFFECT OF PHYTASE ADDITION" BIOSIS, 1992, XP002212002 PREV199294049988 abstract -----	1-7,9,10
A	DATABASE FSTA [Online] INTERNATIONAL FOOD INFORMATION SERVICE (IFIS), FRANKFURT-MAIN, DE; KORDONOWY R K: "Evaluation of bran-containing spaghetti and the phytate-phytase relationship." XP002287640 Database accession no. 86-4-04-m0079 abstract & DISSERTATION ABSTRACTS INTERNATIONAL, B 2143: ORDER NO. DA 8421605, 157PP., vol. 45, no. 7, 1985, N. DAKOTA STATE UNIV. FARGO, N. DAKOTA 58102, USA -----	9

INTERNATIONAL SEARCH REPORT

Information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)		Publication date
DE 10126970	A 05-12-2002	DE 10126970 A1		05-12-2002
		WO 02098442 A2		12-12-2002
		EP 1392353 A2		03-03-2004
-----	-----	-----	-----	-----
WO 02054881	A 18-07-2002	CA 2432965 A1		18-07-2002
		WO 02054881 A2		18-07-2002
		EP 1389915 A2		25-02-2004
		US 2004058049 A1		25-03-2004
-----	-----	-----	-----	-----
US 2834678	A 13-05-1958	NONE		
-----	-----	-----	-----	-----
US 2310383	A 09-02-1943	NONE		
-----	-----	-----	-----	-----
EP 0619369	A 12-10-1994	EP 0619369 A1		12-10-1994
		AT 244302 T		15-07-2003
		CA 2120265 A1		06-10-1994
		DE 69333071 D1		07-08-2003
		DE 69333071 T2		06-05-2004
		DK 619369 T3		06-10-2003
		ES 2202305 T3		01-04-2004
		FI 941545 A		06-10-1994
		JP 6319539 A		22-11-1994
		NO 941183 A		06-10-1994
		PT 619369 T		28-11-2003
		US 5443979 A		22-08-1995
		US 5554399 A		10-09-1996
-----	-----	-----	-----	-----
US 5217959	A 08-06-1993	NONE		
-----	-----	-----	-----	-----
JP 7067635	A 14-03-1995	JP 3484208 B2		06-01-2004
-----	-----	-----	-----	-----
JP 59166049	A 19-09-1984	JP 1027706 B		30-05-1989
		JP 1543660 C		15-02-1990
		KR 9000960 B1		23-02-1990
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Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.: because they relate to subject matter not required to be searched by this Authority, namely:
Although claim 10 is directed to a method of treatment of the human/animal body, the search has been carried out and based on the alleged effects of the compound/composition (Rule 39.1(iv) PCT).
2. Claims Nos.: because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. Claims Nos.: because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box III Observations where unity of Invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-10

Remark on Protest

The additional search fees were accompanied by the applicant's protest.

No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box II.1

Although claim 10 is directed to a method of treatment of the human/animal body, the search has been carried out and based on the alleged effects of the compound/composition (Rule 39.1(iv) PCT).

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-10

- 1A Preparation comprising active phytase, phytate and essential cation (claims 1-6)
- 1B Method for preparation (claim 7)
- 1C Use of preparation (claim 8)
- 1D Food product (claim 9)
- 1E Use of preparation according to claims 1-6 or 9 (claim 10)

2. claims: 11-13, 18

- 2A Condiment comprising active phytase (claims 11-13)
- 2B Use of condiment (claim 18)

3. claims: 14-15, 19

- 3A Dry food product comprising active phytase (claims 14-15)
- 3B Use of dry food product (claim 19)

4. claims: 16,17, 20

- 4A Soymilk comprising active phytase (claims 16-17)
- 4B Use of soymilk (claim 20)
